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Detecting a data set structure through the use of nonlinear projections search and optimization. (English) [Zbl 1274.68376](#)

Kybernetika 34, No. 4, 375-380 (1998).

Summary: Detecting a cluster structure is considered. This means solving either the problem of discovering a natural decomposition of data points into groups (clusters) or the problem of detecting clouds of data points of a specific form. In this paper both these problems are considered. To discover a cluster structure of a specific arrangement or a cloud of data of a specific form a class of nonlinear projections is introduced. Fitness functions that estimate to what extent a given subset of data points (in the form of the corresponding projection) represents a good solution for the first or the second problem are presented. To find a good solution one uses a search and optimization procedure in the form of evolutionary programming. The problems of cluster validity and robustness of algorithms are considered. Examples of applications are discussed.

MSC:

68T10 Pattern recognition, speech recognition

62H30 Classification and discrimination; cluster analysis (statistical aspects)

Keywords:

[cluster structure](#); [nonlinear projection](#)

Full Text: [Link](#)

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